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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/633,055	07/31/2003	Shahriar Ahmed	42P10970C	3607

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EXAMINER

IM, JUNGHWA M

ART UNIT	PAPER NUMBER
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2811

DATE MAILED: 03/11/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

6

<b>Office Action Summary</b>	Application No.	Applicant(s)	
	10/633,055	AHMED ET AL.	
	Examiner	Art Unit	
	Junghwa M. Im	2811	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 08 December 2004.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 13, 17-22 and 27-31 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☐ Claim(s) \_\_\_\_\_ is/are rejected.
- 7) ☒ Claim(s) 13, 17-22 and 27-31 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)                                   | 4) <input type="checkbox"/> Interview Summary (PTO-413)                     |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)               | Paper No(s)/Mail Date. _____  |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date <u>11/03/04</u> .  | 6) <input type="checkbox"/> Other: _____                                    |

## DETAILED ACTION

### *Claim Rejections - 35 USC § 102*

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in-

(1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effect under this subsection of a national application published under section 122(b) only if the international application designating the United States was published under Article 21(2)(a) of such treaty in the English language; or

(2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that a patent shall not be deemed filed in the United States for the purposes of this subsection based on the filing of an international application filed under the treaty defined in section 351(a).

Claims 13, 18, 19, 21, 22, 27, 30 and 31 are rejected under 35 U.S.C. 102(e) as being anticipated by Suzuki (U.S. Pat. No. 6,232,638).

Regarding claim 13, Figure 1 of Suzuki shows a bipolar junction transistor comprising:

in a substrate 101, a first isolation structure 102 to the right spaced apart from a second isolation structure 102 in the center;

an emitter stack 114 disposed above the substrate and between the first isolation structure 102 space apart from the second isolation structure 102; and

a recess (116a in Fig. 4d) disposed adjacent and between the emitter stack and the first isolation structure, wherein the recess exposes a collector tap.

Regarding claim 18, Figure 1 of Suzuki shows a bipolar junction transistor further including:

in a substrate 101, an epitaxial base layer 129 disposed below the emitter stack 114;

a collector structure 127 disposed in the substrate below the emitter stack 114; and

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an intrinsic base structure 109 disposed between the emitter cut and the collector structure 127.

Regarding claim 19, Figure 1 of Suzuki shows a bipolar junction transistor further including:

in a substrate 101, an epitaxial base layer 129 disposed below the emitter stack 114;  
a collector structure 127 disposed in the substrate below the emitter stack 114; and  
a dielectric layer (106 in Fig. 3c) disposed above the substrate and below the emitter stack, wherein the dielectric layer includes an emitter cut disposed above the collector structure 127; and

an intrinsic base structure 109 disposed between the emitter cut and the collector structure 127.

Regarding claim 21, Figure 1 of Suzuki shows a bipolar junction transistor, wherein the substrate includes a BiCMOS structure (structure with 130, 128).

Regarding claim 22, the BJT of Suzuki is a heterojunction BJT device.

Regarding claim 27, Figure 1 of Suzuki shows the collector tap 127 is self-aligned.

Also, note that "self-aligned" is a process designation and would thus not carry patentable weight in this claim drawn to a product. See *In re Thorp*, 227 USPQ 964 (Fed. Cir. 1985).

Regarding claim 30, the substrate of Suzuki can be either P-type or N-type which also can be the same for the collector tap.

Regarding claim 31, Figure 1 of Suzuki shows the recess is a contact corridor 133.

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 20, 28 and 29 are rejected under 35 U.S.C. 103(a) as being obvious over Suzuki.

Regarding claims 20, 28 and 29, it is obvious that the collector tap can be either a P-type or N-type depending on the type of a bipolar transistor and the concentration of the doping for the collector tap can be varied in order to achieve an optimal conductivity in an IC structure.

***Claim Rejections - 35 USC § 103***

Claim 17 is rejected under 35 U.S.C. 103(a) as being unpatentable over Suzuki in view of U'ren (U.S. Pat. No. 6,365,479).

Regarding claim 17, Suzuki teaches most aspect of the instant invention except the buried layer.

However, U'ren shows in Fig. 1, a BJT with a buried layer which connects the first isolation structure and the second isolation structure.

It would have been obvious to one of ordinary skill in the art at the time of the invention to combine the teachings of Suzuki and U'ren in order to have a buried layer connecting two isolation structures since such a structure alleviates the noise accumulation in a device.

***Response to Arguments***

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Applicant's arguments filed December 8, 2004 have been fully considered but they are not persuasive. The rejection is maintained and Examiner presents the remarks below in response to the Applicant's arguments.

On page 5, Applicant argues that "As can be seen from Suzuki '638, the recess (116a) of Suzuki '638 is formed between TWO ISOLATION REGIONS (102) and NOT between an emitter stack and a first isolation structure as recited in Applicant's claim 1. ... The recess 116a of Suzuki '638 is not adjacent the emitter stack." Examiner disagrees. Figure 1 of Suzuki clearly shows that the recess (116a) of Suzuki '638 is formed between two isolation regions (102), in detail, between the first isolation region to the far right and the second isolation region which is sandwiched between the emitter stack (114) and the recess (116a in Fig. 4d). And as shown in Fig. 1, the recess (116a) of Suzuki '638 is adjacent the emitter stack (114).

Applicant additionally argues that "with regard to claims 18-19, Suzuki '638 did not teach an epitaxial layer disposed below the emitter stack. The emitter stack 114 in Suzuki '638 is formed on the substrate 101 and not on any epitaxial layer." It is pointed out that the instant invention recites that an epitaxial *base layer* disposed below the emitter stack, not an epitaxial layer disposed below the emitter stack. And the instant invention further discloses that the base is formed from the epitaxial silicon, and it is noted that a term "epitaxial" is a process designation, and would thus not carry patentable weight in this claim drawn to a product. See *In re Thorp*, 227 USPQ 964 (Fed. Cir. 1985). With this understanding, there is no structural difference between the instant invention and Suzuki '638.

Applicant also argues that "Suzuki '638 did not teach a self-aligned recess disposed between the emitter stack and the first isolation structure." With the understanding that the

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instant invention does not define "a self-aligned recess," Fig. 1 of Suzuki '638 shows a trench which is structurally identical to the self-aligned recess of the instant invention is disposed between the emitter stack (114) and the first isolation structure (120 to the far right of the figure).

Applicant also argues that "in Applicant's claim 1, the trench, or recess 138, is flushed against the emitter and is not separated from the emitter by the isolation structure." Note that the instant invention does not recite this limitation.

### ***Conclusion***

**THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the mailing date of this final action.

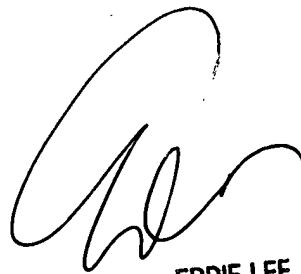
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Junghwa M. Im whose telephone number is (571) 272-1655. The examiner can normally be reached on MON.-FRI. 8:30AM-5:00PM.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Eddie C Lee can be reached on (571) 272-1732. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

jmi



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